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**Original Research Article**

# Drug prescribing and health-related quality of life among pregnant women attending antenatal clinics at two health facilities in Bayelsa State, Nigeria

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## Abstract

**Purpose:** To study drug prescribing and health-related quality of life (HRQoL) among pregnant women who attended antenatal clinics at Amassoma General Hospital and Amassoma Comprehensive Health Center in Bayelsa State from January to April, 2018.

**Methods:** Pertinent patients' (n=152) data evaluated included diseases presented, systolic and diastolic blood pressure (SBP/DBP), including medications prescribed. Also, patients' HRQoL data incorporating both physical and mental components were assessed using Short Form-12v2 questionnaire. All data generated were analyzed as appropriate and mean values for HRQoL data described in relation to the mid-point norm, 50±10.

**Results:** Pains, malaria, and cough/catarrh were treated in 45 (41.7%), 15 (13.9%), and 13 (12.0%) of the pregnant women, respectively among other conditions. Proportions of the subjects with normal SBP and DBP were 145 (95.4%) and 137 (90.1%). In all, 149 (98.0%) of the women were prescribed routine medications required in pregnancy comprising folic acid, ferrous, and vitamin C, although 29 (24.0%) of those (n = 121) who were eligible for intermittent preventive treatment (IPT) for malaria in pregnancy did not receive the therapy. Analgesics, tetanus toxoid, and artemisinin-based combination therapy were widely prescribed for management of pains, prevention of tetanus, and treatment of malarial infection, respectively. On the average, the state of pregnancy impacted both physical (47.56±6.92) and mental (46.88±8.50) health states among the women comparably ($p>0.05$), and substantial proportion (38.2%) of the cohort were at risk of screening positive for first stage depression.

**Conclusion:** Pains, malaria, and cough/catarrh were the most encountered conditions, while analgesics, tetanus toxoid, and artemisinin-based combinations were the majorly prescribed medications among the pregnant women. Also, virtually all of the women received routine medications required in pregnancy. On the average, their physical and mental health statuses were impacted similarly.

**Keywords:** Amassoma, Drug Utilization, Health-Related Quality of Life, Pregnancy

**Indexing:** Index Copernicus, African Index Medicus

## Introduction

Drug use in pregnancy presents special concerns given the peculiar physiologic condition of the mother and the health of the foetus. As a form of precaution, medication use is highly restricted in pregnancy as both mother and the developing foetus may be affected adversely [1]. For instance, the non-steroidal anti-inflammatory drugs among other drugs have been reported to exhibit deleterious effects on the health of pregnant women and the foetus [2]. Also, cases of phocomelia were widely reported in babies given birth to by women who had ingested thalidomide for the treatment of morning sickness during the early stages of their pregnancies in the 1950s and early 1960s [3]. Meanwhile, medication use may be essential both for treatment of disease conditions and preservation of health of either or both

of the mother and foetus. When drugs are required during pregnancy, the risks to benefit ratios are considered and attention given to minimizing associated drug related problems both on the mother and the foetus [4].

The period of pregnancy impacts both physical and mental health components of the health-related quality of life (HRQoL) of the pregnant woman [5]. Corroborating the foregoing, both physical and emotional distresses have been reported by pregnant women in several studies and these were attributed to a number of factors. These factors are categorized into those which specifically affect the physical health status as against those affecting the mental health component of the expectant mothers. One of those impacting the physical health includes increase in body mass index (BMI) during pregnancy which may precipitate lower back pain. Others are fatigue, lower energy and reduced capacity for work as well as nausea and vomiting. On the other hand, emotional stress relating to difficulty in adjusting to maternal role, immaturity, financial dependence and lower level of education particularly due to younger age at conception have been identified as the factors that may impact mental health negatively. Depressive symptoms and altered self-image owing to appearance of melasma in pregnancy amongst others are other factors identified to have negative impacts on the psychology of the mother to be [6].

The World Bank reported that the proportion of pregnant women who received care at antenatal clinics in Nigeria in 2017 was 65.8% [7]. The purpose of such scheduled clinic attendance was to ensure maintenance of health of the mother and foetus as well as prompt identification and treatment of diseases in the event of any [8]. Thus, pregnant women attending antenatal clinics are routinely prescribed drugs often as prophylaxis against anaemia and malaria amongst other conditions or for the management of diagnosed diseases [8, 9]. Therefore, this study was aimed at assessing diseases, medication use and health-related quality of life among pregnant women attending antenatal clinics at two health facilities in Amassoma community which is located in the Southern Ijaw Local Government Area of Bayelsa State, Niger Delta Area, South-South of Nigeria.

# Methods

### Setting

The study was conducted at the antenatal clinics of Amassoma General Hospital (AGH) and Amassoma Community Comprehensive Health Center (ACHC) both of which are located in Amassoma, the largest of the riverine communities on Wilberforce Island in Southern Ijaw Local Government Area of Bayelsa State, South-South, Nigeria. The two facilities provide healthcare services to the estimated 430,100 people who reside in the Local Government Area [10].

### Study Design

The study involved a prospective observational evaluation of diseases, medication use and health-related quality of life among pregnant women who attended antenatal clinics at AGH and ACHC over a period of 4 months, from January to April, 2018.

The 255 pregnant women who attended scheduled antenatal clinics at the study centers within the study period were approached. Those (n = 152) who attended clinics more than once and who consented to be involved in the study were recruited while those who did not wish to take part in the study and those attending the clinics for the first time were excluded.

### Data Collection

The Short Form 12v2® (SF-12v2®) questionnaire (Quality Metric Incorporated, USA) was used for the collection of data on patients' HRQoL while adopting a 4-week recall period. The SF-12v2® contains 12 items arranged in 8-health domains which elicit responses for the purpose of assessment of physical and mental health statuses of a respondent. The physical functioning (PF), role-physical (RP), bodily pain (BP), and general health (GH) subscales collectively measure the respondent's physical health status. On the other hand, the vitality (VT), social functioning (SF), role-emotional (RE), and mental health (MH) subscales jointly assess the respondent's mental health status. In addition, a data collection form was designed and employed in collecting respondents' demographics, diseases diagnosed (if any), routine and/or requisite medications prescribed as well as the SBP and DBP measurements.

Copies of the SF-12v2® questionnaire were administered to the consenting pregnant women following vital signs documentation while waiting to see the prescribers by adopting a combination of self-administration and interview. Afterwards, relevant data were extracted from the patients' case notes using the data collection form and evaluated as appropriate.

Outcomes measured included drug utilization patterns with particular references to routine medications for maintaining pregnancy, medications prescribed for management of diseases diagnosed, and intermittent preventive therapy (IPT) against malaria in pregnancy. Also determined were clinical variables incorporating diseases diagnosed (when present) including SBP and DBP (normal BP: SBP/DBP < 130/80 mmHg), [11]. Also, patients' HRQoL data were measured via physical component summary and mental component summary scores (PCS and MCS). The PCS and MCS subscale scores were used to

compute the overall HRQoL for all patients surveyed and their average values described in relation to the general population average (i.e. norm based) score of 50 ± 10 (on a scale of 0 – 100). Better health is indicated by observations > 50, while observations < 50 indicates worse health. Also, proportion of respondents whose MCS scores are "at" or "below" 42 are considered to be at risk of First Stage Positive Depression Screening [12].

**Ethical Issues**

Approval to conduct the study was obtained from the managements of both Amassoma General Hospital and Amassoma Comprehensive Health Center and respect for patients' privacy was ensured.

**Data Analysis**

Statistical Package for Social Sciences (SPSS) v23 (International Business Machines (IBM) Corp.) and GraphPad Instat v3.10 for windows (GraphPad Software, San Diego, California, USA) were employed for the analysis of the clinical and medication data and presented using descriptive statistics. The Optum® PRO CoRE scoring software v1.2.4, Microsoft Office Excel 2007 (Microsoft Office Enterprise 2007) and GraphPad Instat v3.10 for windows (GraphPad Software, San Diego, California, USA) were used for the evaluation of the HRQoL data. Data generated for the socio-demographics, clinical, medications, and HRQoL variables were expressed in mean ± standard deviation (SD) and simple percentages as appropriate. Average values generated for the PCS and MCS scores were compared using Student t-test while categorical variables were evaluated by Fisher's Exact test accordingly. Level of significance at 2-tailed test was set at $p < 0.05$.

# Results

The response rate recorded for the study was 60.0% and 120 (78.9%) of the pregnant women (n = 152) recruited were in the age range of 18 – 34 years. Their average age was 28.58 ± 6.39 years. Equal proportions of the cohort either engaged in some form of employment (50.0%) or were dependents (50.0%). One hundred and four (68.4%) of the women were in the second trimester of their pregnancy while the remaining 31 (20.4%) and 17 (11.2%) were in their first and third trimesters, respectively. Meanwhile, proportions of the subjects with normal SBP and DBP were 145 (95.4%) and 137 (90.1%), respectively (Table 1).

Majority of the pregnant women studied complained of body pain (41.7%). This was distantly followed by those who presented with malaria (13.9%), cough with catarrh (12.0%), and urinary tract infections (9.3%) among others. Meanwhile, an average pregnant woman seen presented with 0.77 ± 0.99 disease condition (Table 2).

Thirty-one (20.4%) of the 152 pregnant women studied were not yet eligible for IPT for malaria as at the time of the study. However, of all 121 (79.6%) who were eligible, 29 (24.0%) did not receive the therapy. Meanwhile, virtually all (98.0%) of the women were prescribed routine medications for the maintenance of their pregnancies. In addition, analgesics, tetanus toxoid, artemisinin-based combination therapy, and antibacterial therapy were the majorly prescribed therapies for the conditions presented by the pregnant women at 47.0, 22.4, 8.2, and 7.6%, respectively amongst others (Table 3).

**Table 1:** Demographic and clinical profiles of the pregnant women

| Patients' Characteristics (n = 152) | N (%) |
|---|---|
| Age (years) | |
| < 18 | 5 (3.3) |
| 18 – 34 years | 120 (78.9) |
| ≥ 35 | 27 (17.8) |
| Occupation | |
| Civil servants | 37 (24.3) |
| Private business owners/artisans | 33 (21.7) |
| Farmers | 6 (4.0) |
| Students | 26 (17.1) |
| Unemployed | 50 (32.9) |
| Stage of Gestation | |
| First trimester | 31 (20.4) |
| Second trimester | 104 (68.4) |
| Third trimester | 17 (11.2) |
| Systolic Blood Pressure (SBP) | |
| Normal SBP | 145 (95.4) |
| High SBP | 7 (4.6) |
| Diastolic Blood Pressure (DBP) | |
| Normal DBP | 137 (90.1) |
| High DBP | 15 (9.9) |

n, total number of subjects in the population studied; N, number of observations; Mean ± SD, SD, standard deviation; Average age of patients, 28.58 ± 6.39; Average SBP, 102.05 ± 13.85; Average DBP 62.08 ± 10.79.

Assessment of the HRQoL data generated from the women surveyed revealed that the state of pregnancy impacted both of their general physical and mental health statuses similarly at average PCS and MCS scores of 47.56 ± 6.92 and 46.88 ± 8.50 ($p = 0.4449$), respectively.

Furthermore, evaluation of the specific subscales of the 8-health domains indicated that the women were more bodily and emotionally impacted by their pregnancy status given that their corresponding average bodily pain (BP) and role emotion (RE) scores of 39.34 ± 11.08 and 42.09 ± 10.01 were low relative to other elements of the physical and mental component summaries. In all, average HRQoL score for the sample report was 47.22 ± 7.75 with patients reporting between 22.96 ± 3.48 and 60.26 ± 4.64 (Table 4).

Significant proportions of the pregnant women reported worse physical (35.5%) and mental (47.4%) health conditions ($p < 0.05$, RR = 1.285, 95% CI: 1.009 - 1.635). In addition, appreciable proportions

**Table 2:** Conditions presented with by the pregnant women

| **Diseases (n = 108)** | **N (%)** |
|---|---|
| Body Pain | 45 (41.7) |
| Malaria in pregnancy | 15 (13.9) |
| Cough/catarrh | 13 (12.0) |
| Urinary Tract Infections | 10 (9.3) |
| Fatigue | 6 (5.6) |
| Insomnia | 5 (4.6) |
| Indigestion | 4 (3.7) |
| Itching | 4 (3.7) |
| Anaemia | 2 (1.9) |
| Hypertension in Pregnancy | 1 (0.9) |
| Loss of appetite | 1 (0.9) |
| Nausea and vomiting | 1 (0.9) |
| Diarrhoea | 1 (0.9) |

**Table 3:** Medications prescribed for the pregnant women

| **Medication Therapy** | **N (%)** |
|---|---|
| Intermittent Preventive Therapy for Malaria (n = 152) | |
| Those not yet eligible for IPT (n = 31) | 31 (20.4) |
| Those eligible for IPT (n = 121) | 121 (79.6) |
| *IPT prescribed* | *92 (76.0)* |
| *IPT not prescribed* | *29 (24.0)* |
| Routine Medications for Maintenance of Pregnancy (n = 152) | |
| Routine medications prescribed | 149 (98.0) |
| Routine medications not prescribed | 3 (2.0) |
| Medications prescribed for various health conditions (n = 183) | |
| Analgesics | 86 (47.0) |
| Artemisinin-based combination therapies | 15 (8.2) |
| Antitussives | 5 (2.7) |
| Antibacterial agents | 14 (7.6) |
| Tetanus toxoid | 41 (22.4) |
| Antiemetics | 6 (3.3) |
| Antacids | 3 (1.6) |
| Antispasmodics | 4 (2.2) |
| Antihypertensives | 1 (0.5) |
| Antihistamines | 6 (3.3) |
| Antifungals | 2 (1.1) |

IPT, Intermittent Preventive Therapy for Malaria in Pregnancy (sulfadoxine-pyrimethamine prescribed when required); Routine medications for maintenance of pregnant (comprises folic acid, ferrous sulphate, vitamin C, +/- calcium lactate).

(38.2%) of the cohort were at risk of screening positive for first stage depression (Table 5).

# Discussion

Health conditions that were managed among the pregnant women within the study period were majorly body pain, malaria, and cough with catarrh among others. Importantly, virtually all of the women exhibited normal BP. However, only one of the fifteen who presented with high blood pressure in pregnancy had the condition managed with the requisite antihypertensive therapy. For pregnancy maintenance, routine medications comprising folic acid, ferrous sulphate, and vitamin C (+/- calcium lactate) were prescribed for almost all of the women studied except two.

On the other hand, not all of those who were eligible for IPT for malaria in pregnancy were prescribed the therapy. Most commonly prescribed medications were the analgesics, tetanus toxoid, and artemisinin-based combination therapy. On the average, the state of pregnancy impacted both physical and mental health conditions among the women comparably and substantial proportion of the cohort was at risk of screening positive for first stage depression.

Most of the pregnant women seen in this study complained of pain. This finding is in consonance with the age long observation among women during pregnancy and has been linked to a number of factors which include increase BMI as well as changes in mechanical and hormonal balance [13]. A sizeable proportion of the pregnant women studied also presented with malaria and this calls for utmost attention. This is because malaria in pregnancy has been reported to be a major cause of maternal morbidity particularly in Africa. It has also been noted to be responsible for chronic anaemia in pregnancy including reduction in birth weight and increase risk of neonatal death [9].

The swampy nature of Amassoma and its environs favours the breeding of mosquitoes which are responsible for the transmission of malaria. Expectedly, this exposes the local inhabitants especially the pregnant women to malarial infection with the attendant morbidity and mortality. Fortunately, a number of measures can be adopted to prevent the foregoing and they include – the use of mosquito insecticide treated nets (ITN), insecticide sprays, insect repellants and draining of water bodies where mosquitoes breed [14]. Asides the above-mentioned disease states, cough with catarrh was also abundantly encountered among the pregnant women in this study. Interestingly, this condition has been observed to be self-limiting in most cases and rarely requires medications [15].

That very few of the women studied presented with hypertension in pregnancy does not imply that the need to closely monitor BP measurements in the rest of the cohort be relaxed. More importantly, pregnant women are to be made aware of the need to seek help in the event of severe headache, vision problems, severe pain below the ribs, vomiting, and swelling of the face and the limbs all of which may be symptoms of pre-eclampsia. This is because elevated BP in pregnancy poses risks to the health of both mother and the developing foetus [16].

**Table 4:** SF-12v2 scales and summary measure scores for the pregnant women's Health-Related Quality of Life

| Norm-Based Scoring Domains | Mean ± SD | Minimum Scores | Maximum Scores |
|---|---|---|---|
| Physical Health Domain Scales | | | |
| Physical Functioning (PF) | 50.95 ± 8.98 | 25.58 | 57.06 |
| Role Physical (RP) | 46.10 ± 7.38 | 23.61 | 57.46 |
| Bodily Pain (BP) | 39.34 ± 11.08 | 21.66 | 57.73 |
| General Health (GH) | 49.62 ± 7.83 | 23.90 | 63.66 |
| Physical Component Summary (PCS) | *47.56 ± 6.92 | 28.96 | 58.86 |
| Mental Health Domain Scales | | | |
| Vitality (VT) | 52.82 ± 9.80 | 29.39 | 68.74 |
| Social Functioning (SF) | 46.95 ± 8.50 | 21.32 | 56.90 |
| Role Emotion (RE) | 42.09 ± 10.01 | 19.89 | 56.28 |
| Mental Health (MH) | 48.28 ± 8.98 | 18.32 | 64.21 |
| Mental Component Summary (MCS) | *46.88 ± 8.50 | 25.21 | 67.10 |
| Average HRQoL Score (Mean ± SD) | 47.22 ± 7.75 | 22.96 ± 3.48 | 60.26 ± 4.64 |

Student t-test, *p = 0.4449; General Population Norm Based Score (NBS), 50 ± 10; Observation > 50 indicates better health while observation < 50 indicates worse health.

**Table 5:** Observations on patients' health conditions and outcomes of first stage positive depression screening

| Observations | PCS, N (%) | MCS, N (%) |
|---|---|---|
| Proportion of the pregnant women with better health | 98 (64.5) † | 80 (52.6) † |
| Proportion of the pregnant women with worse health | 54 (35.5) † | 72 (47.4) † |
| First stage positive depression screening | | |
| Proportion of the pregnant women at risk | - | 58 (38.2) |
| Proportion of the pregnant women not at risk | - | 94 (61.8) |

† Fisher's Exact Test, p < 0.05, RR = 1.285, 95% CI: 1.009 - 1.635; PCS, physical Component Summary; MCS, Mental Component Summary; RR, Relative Risk; CI, Confidence Interval.

Routine medications as described above were generously prescribed for the women studied in keeping with the recommendation of WHO on pregnancy care. The WHO recommends that pregnant women be prescribed daily oral iron formulation (containing 30 mg to 60 mg of elemental iron) and 400 µg (0.4 mg) folic acid in order to prevent maternal anaemia, puerperal sepsis, low birth weight, and preterm birth. The dose of the daily elemental iron should be increased to 120 mg in pregnant women with confirmed anaemia until the condition resolves after which she can revert to the standard dose. Also, it is important that folic acid be commenced as early as before conception to prevent neural tube defects [17].

There are conflicting conclusions as to the importance of calcium and vitamin C supplementations in pregnancy. Nevertheless, there are reports which support supplementation with calcium for the purpose of reducing the risk of pregnancy induced hypertension particularly in women with low basal calcium intake and protection against low birth weight in babies [18]. On the other hand, there are no convincing evidences for the benefit of vitamin C in the prevention of stillbirth, neonatal death, preterm birth, low birth weight babies or pre-eclampsia as claimed elsewhere [19]. The prescribers at the study centers need to be reminded of the importance of prompt prescribing of IPT for malaria in pregnancy given that not all those who were eligible for the therapy were covered. The WHO recommends that every pregnant woman who resides in malaria-endemic areas in Africa be prescribed IPT (with sulfadoxine-pyrimethamine) starting from the second semester. This should be followed by at least two more doses to make a total of three doses and a month interval observed between each of the therapy. This is to avoid the risks posed by malaria infection in the pregnant woman, her foetus, and the newborn [20].

Analgesics were the most encountered of all agents prescribed pain been the most managed health conditions within the study period. This is contrary to findings elsewhere in the country in which more patients received antimalarial medications compared to the analgesics [21]. Tetanus toxoid was also appreciably prescribed for the pregnant women seen in line with the recommendations of WHO in order to prevent neonatal death due to tetanus [20]. Moreover, the endemic nature of malaria within the community hosting the study centers [14] was confirmed by the incidences of the condition requiring the prescribing of requisite antimalarials.

Overall, the study revealed that the state of pregnancy impacted both of the general physical and mental health states of the women similarly, and the burden was more on their emotional and bodily components. This finding is in contrast to the outcome of a study conducted among a group of pregnant women in Australia in which it was observed that the physical health status significantly decreased relative to the mental health status [22]. That considerable proportion of the pregnant subjects surveyed were observed to be at risk of screening positive for first stage depression is suggestive of a need for their further evaluation given that women have been noted to be predisposed to depression during pregnancy [23].

The norm-based score (50 ± 10) adopted for the evaluation of the mean HRQoL data generated in this study using the SF-12v2 questionnaire was that derived and standardized for the United States' general population. Also, the pregnant subjects studied were drawn from only two of the health facilities located in the Southern Ijaw Local Government Area of Bayelsa State. Thus, findings from this study may not be generalized to the pregnant women attending antenatal clinics at other clinics in the State.

# Conclusion

Majority of the pregnant women studied were treated for pain, malaria, and cough with catarrh and virtually all exhibited normal BP. Supplementations comprising folic acid, ferrous sulphate, and vitamin C were routinely prescribed for almost all of the pregnant women. Asides the foregoing, analgesics, tetanus toxoid, and artemisinin-based combination therapy were the most prescribed medications for the management of pain, prevention of neonatal death due to tetanus, and treatment of malarial infection, respectively. However, there is a need to reiterate the importance of prescribing IPT for malaria in pregnancy for the eligible subjects who attend antenatal clinics at the study centers. Generally, the state of pregnancy impaired both physical and mental health states among the pregnant women comparably and the considerable proportion of the cohort who exhibited tendency to screen positive for first stage depression requires further assessment

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# Conflict of Interest

No conflict of interest is associated with this work.

# Contribution of Authors

We declare that this work was done by the authors named in this article and all liabilities pertaining to claims relating to the content of this article will be borne by the authors. KAG designed the study, managed the data, and wrote the manuscript. CMJ contributed to data management. POE revised the manuscript critically. All authors read and approved the final manuscript.

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